ENVIRONMENTAL CONSTRUCTION PRACTICE SPECIFICATIONS

for the Province of Nova Scotia

85-3248/

Province of Nova Scotia
Environmental Construction Practice
Specifications

Prepared Jointly by:

The Staff of
Canada Department of Fisheries and Oceans
Nova Scotia Department of the Environment

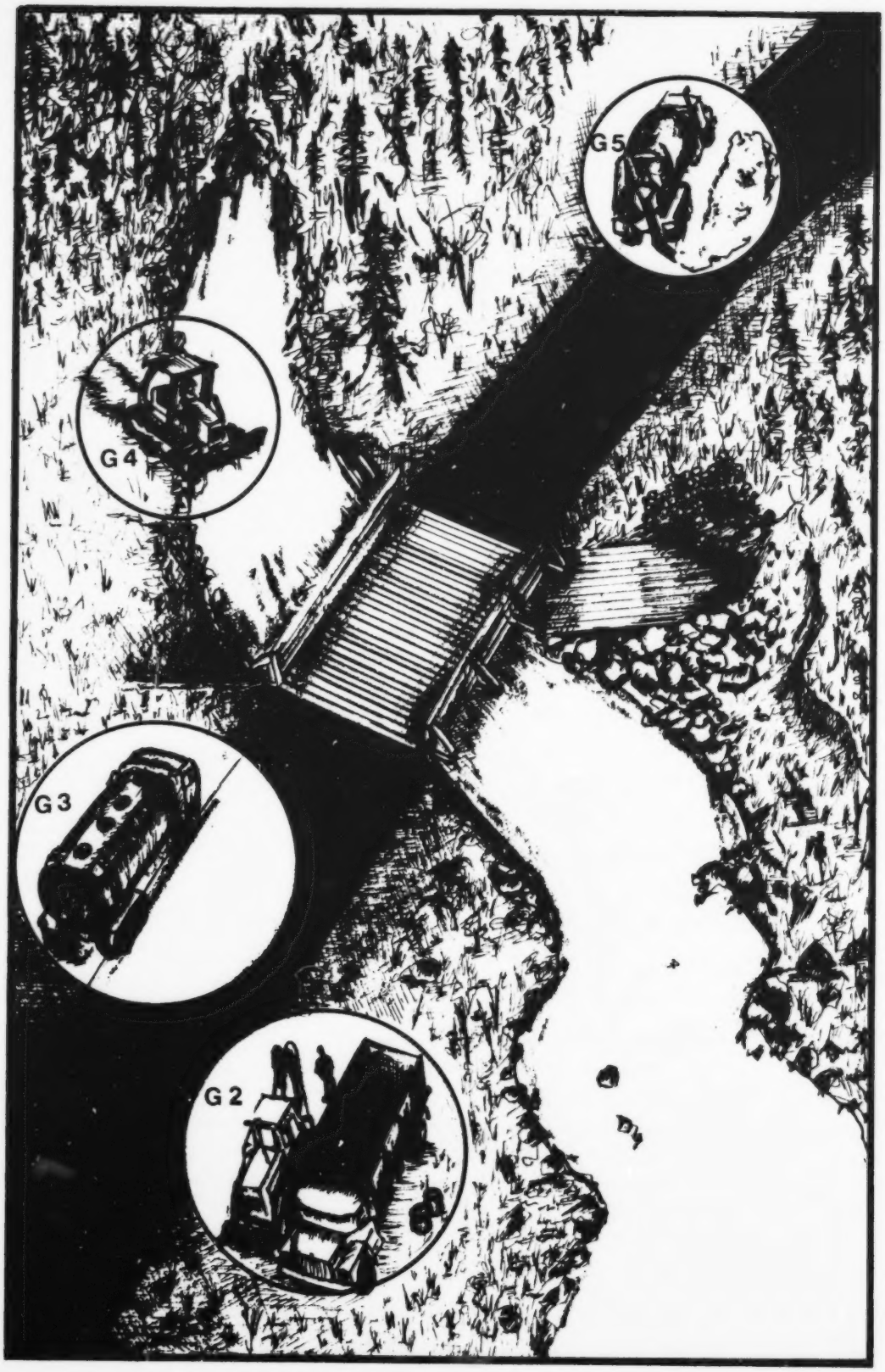
and the

Nova Scotia Department of Transportation

September, 1981
Halifax, Nova Scotia

Illustrated December 1984

General Specificaitons 2, 3, 4, 5



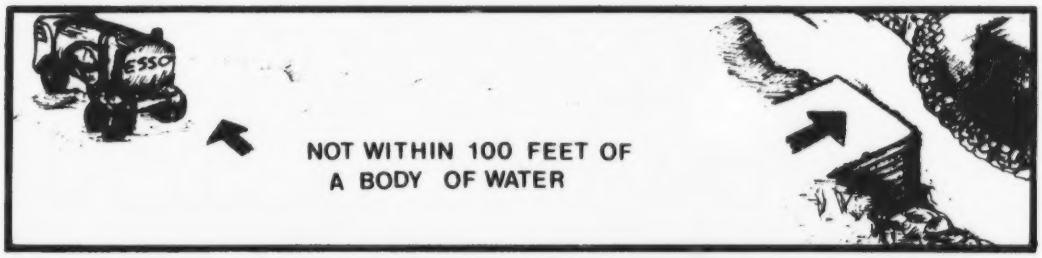
ENVIRONMENTAL CONSTRUCTION PRACTICE SPECIFICATIONS
(NOVA SCOTIA) (SEPTEMBER, 1981)

General Specifications

G1. Copies of all provincial permits together with their stipulations shall be available on the site at all times during the construction day. Construction shall not start until all applicable permits are approved.

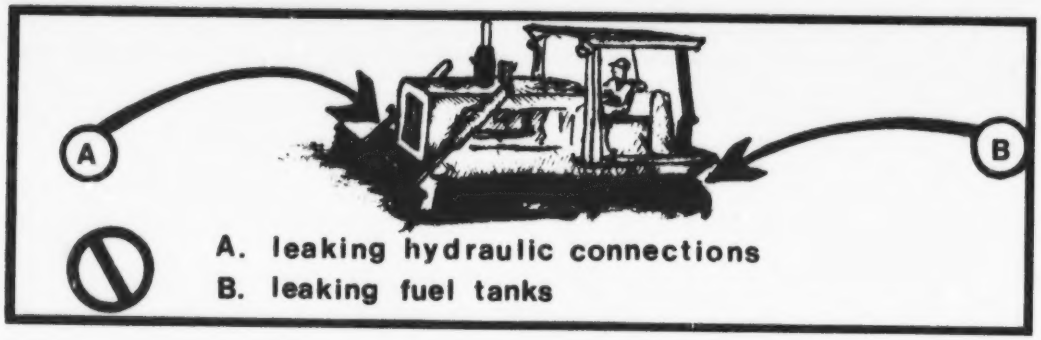
TIMING OF INSTREAM WORK SHALL BE SPECIFIED IN THE WATER RIGHTS PERMITS.

G2. In areas historically known to be subject to flash floods, the temporary on-site storage of machinery and potential pollutants must be stored in an area above the flood water limits.

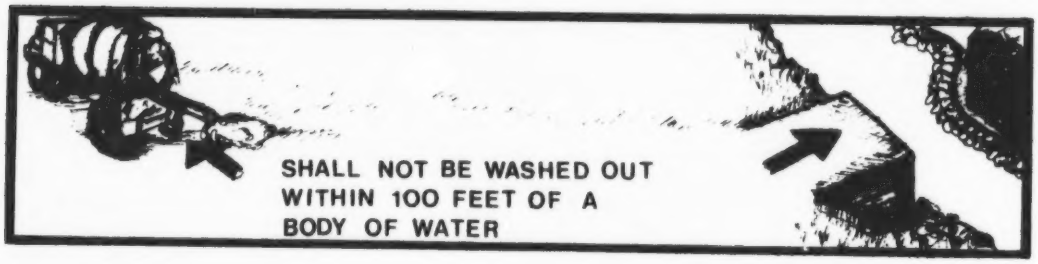


G3. Fuel storage and refueling or lubrication of equipment shall only be permitted in areas designated by the Engineer. These areas shall be located such that accidental pollutant discharge will not enter surface water or domestic water supplies. Under no circumstances will the designated area be within 100 feet of a body of water[1]. Note: This clause is not applicable to pile driving equipment.

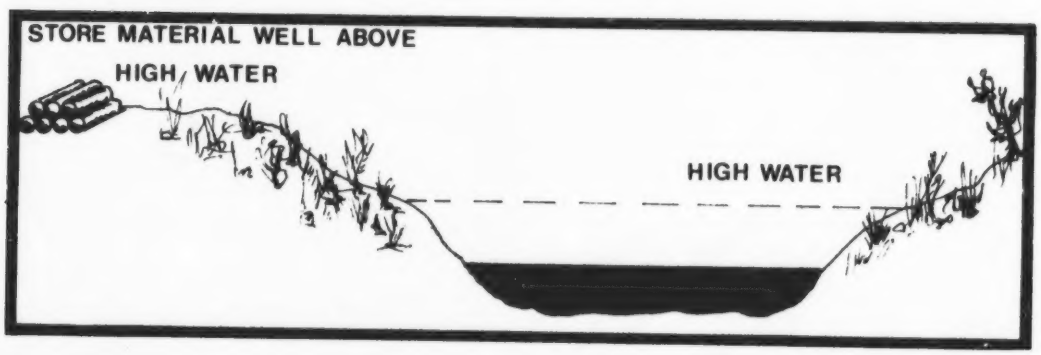
[1]As defined in the Water Act.



G4. Equipment required to work within a body of water shall be mechanically sound, having no leaking fuel tanks or hydraulic connections.



G5. Machinery (e.g., concrete trucks) shall not be washed out within 100 feet of a body of water or in an area where wash water will run into a body of water.



G6. All construction debris near or intruding a body of water shall be disposed of, or placed in a manner where flood water will not come in contact with the debris.

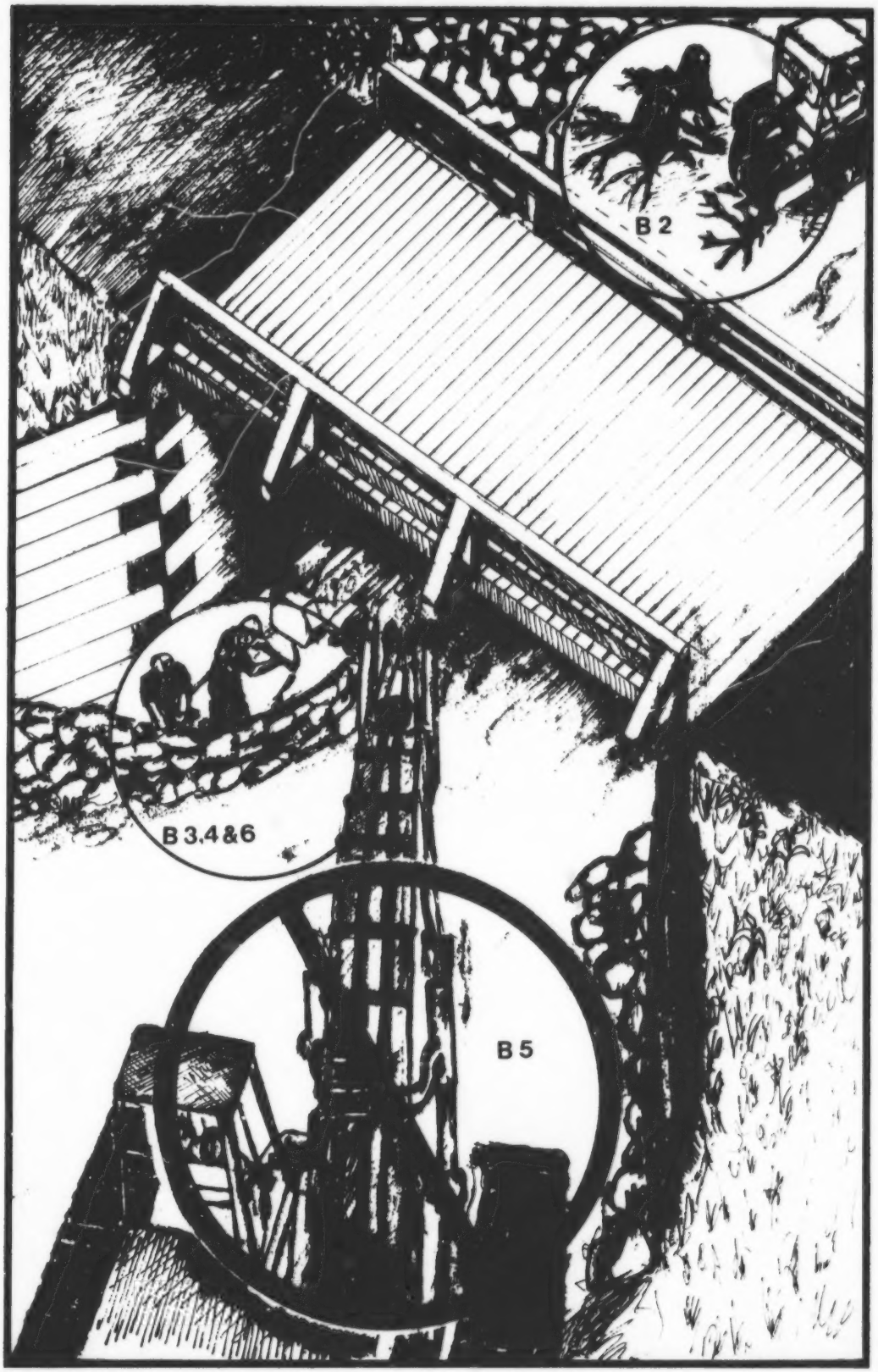
General Specifications 6, 7, 8

G7. Unnecessary watercourse alterations (e.g., bulldozing) or unnecessary multiple fording locations shall be considered reason for temporary shutdown of the operation involved. The operation will remain shut down until corrective measures, as directed by the Engineer, are completed. All costs for corrective work and delay time shall be borne by the contractor.

G8. Fish passage shall be provided at all times.

G9. All environmental construction practices shall be to the satisfaction of the Engineer.

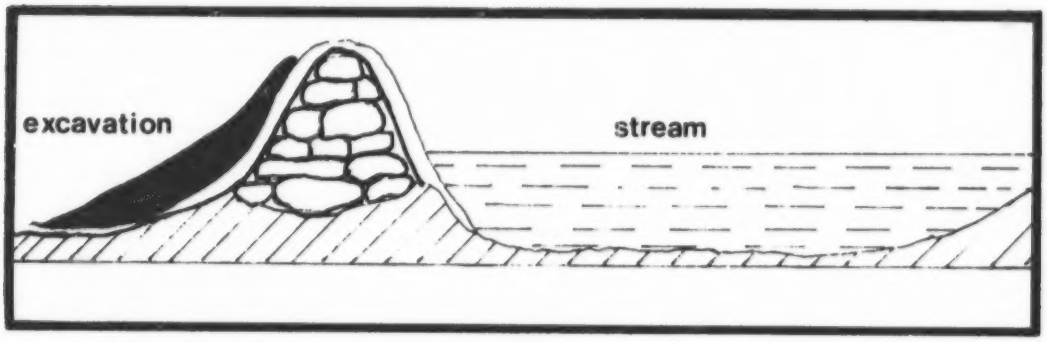
Bridges 2, 3, 4, 5, 6



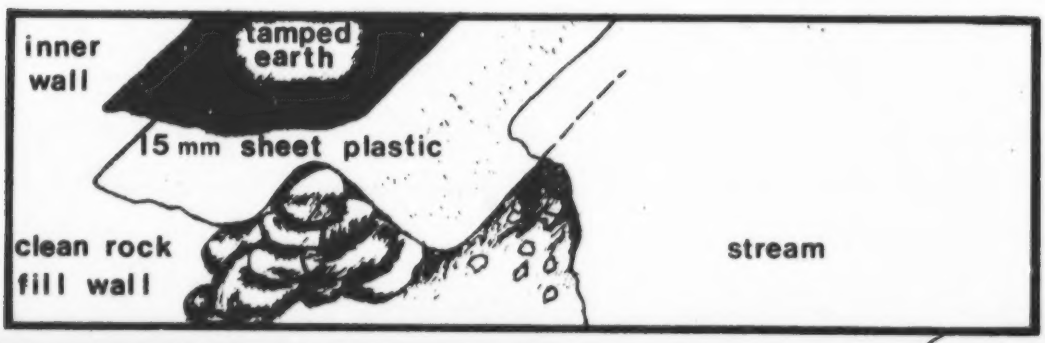
Bridges

B1. All work operations shall be conducted in a manner to cause a minimum of siltation and disturbance to the adjacent and downstream areas.

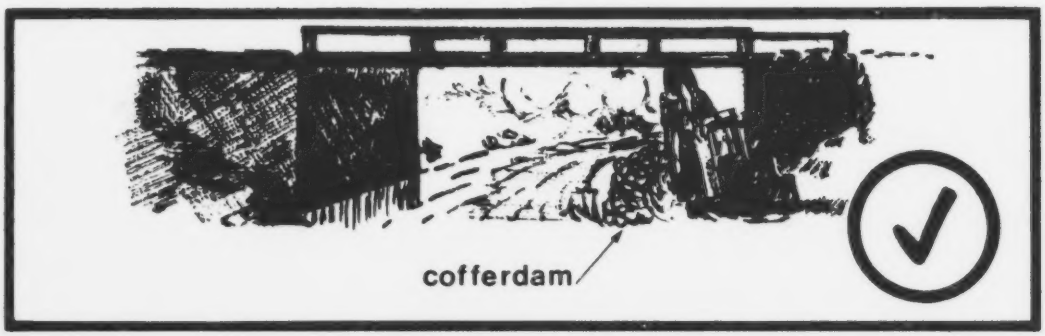
B2. Grubbing shall be limited to the abutments and piers and the area required for the adjacent backfill to reach natural slope stability.



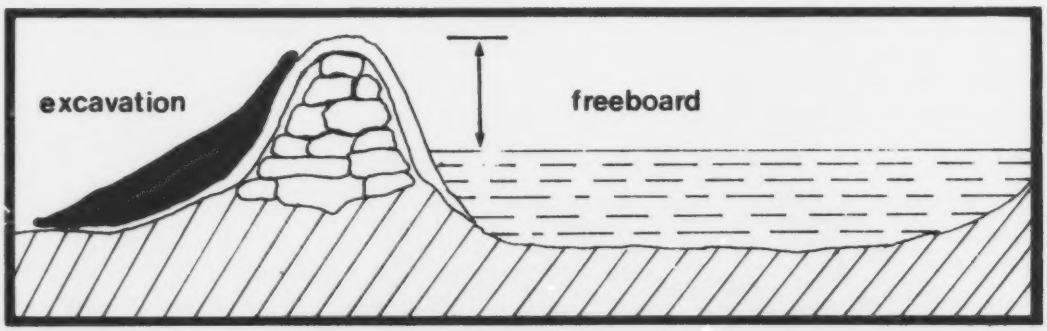
B3. Excavations shall be conducted in such a manner as to keep the work area separated from the flowing stream.



B4. If necessary, earthen cofferdams may be used to separate the entire work area from the flowing stream. All cofferdams shall be constructed of approved materials to prevent erosion and siltation. One possible cofferdam cross-section could consist of a clean rock outer wall, backed with 15 mil sheet plastic, with an inner wall of impervious earth fill placed over the plastic.

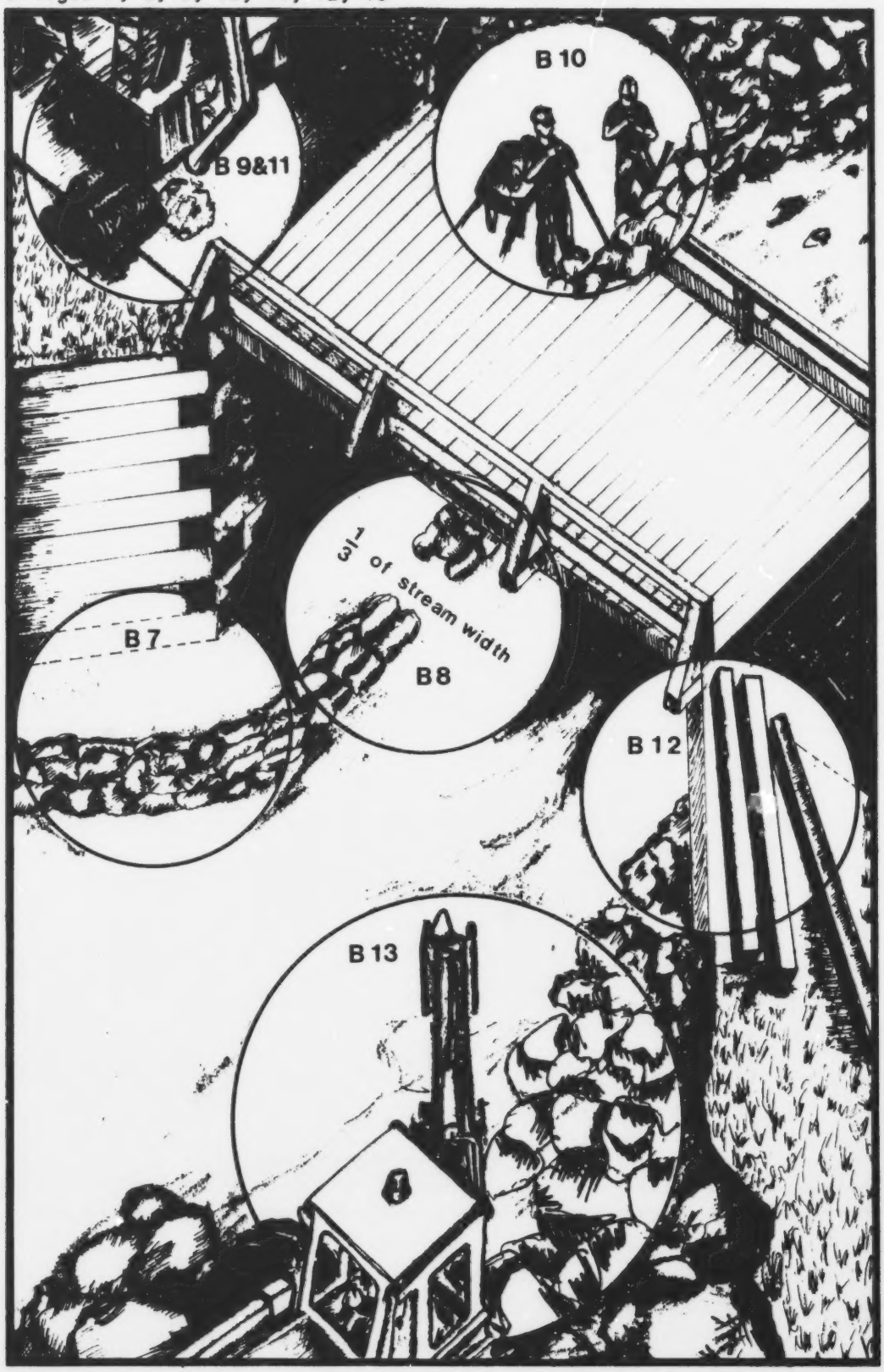


B5. Excavation from the bed or banks of a watercourse outside the cofferdam limits shall not be permitted.

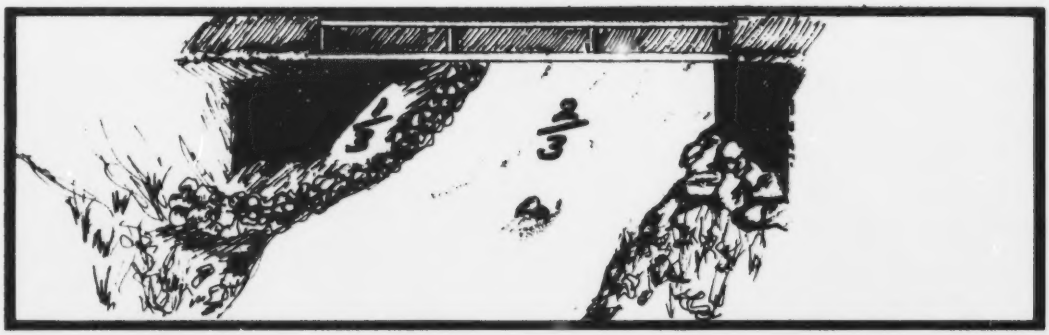


B6. Cofferdams shall have sufficient freeboard.

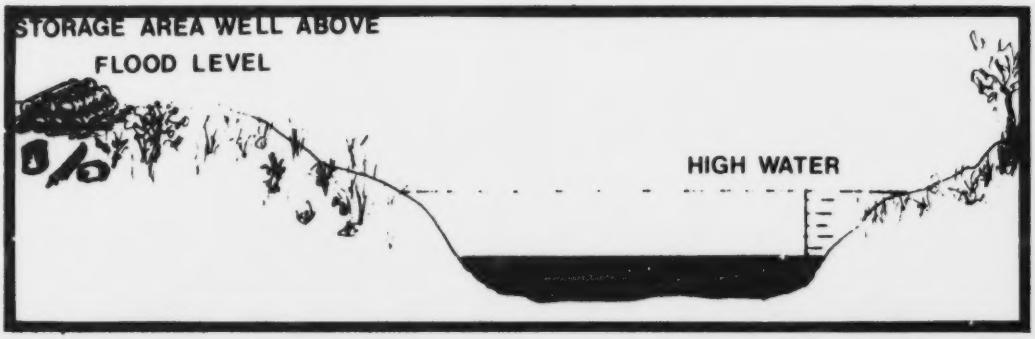
Bridges 7, 8, 9, 10, 11, 12, 13



B7. No excavation is to take place inside the cofferdam until the cofferdam is completely closed.



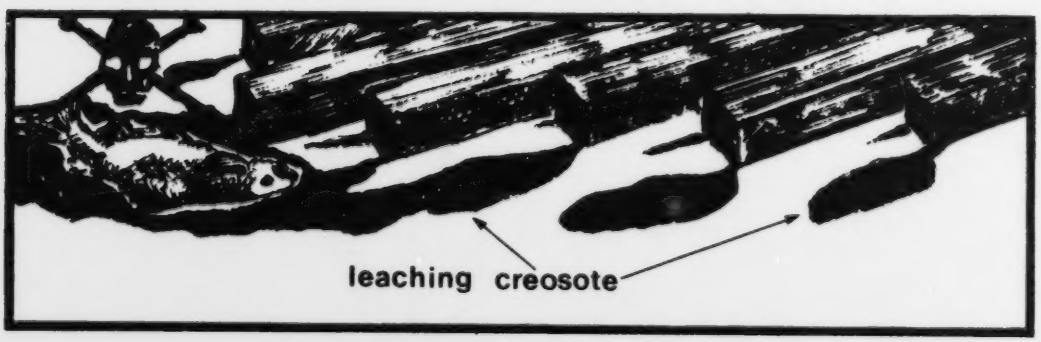
B8. Unless previously approved, not more than 1/3 of the stream width shall be blocked at any one time during construction.



B9. Any construction debris or excess material shall be prevented from entering a watercourse or stored in an area above high water.

B10. Care shall be taken during removal of cofferdams to minimize cofferdam material from washing into the stream.

B11. Protection shall be provided to assure that no fresh concrete, lime, or cement is allowed to enter a watercourse.

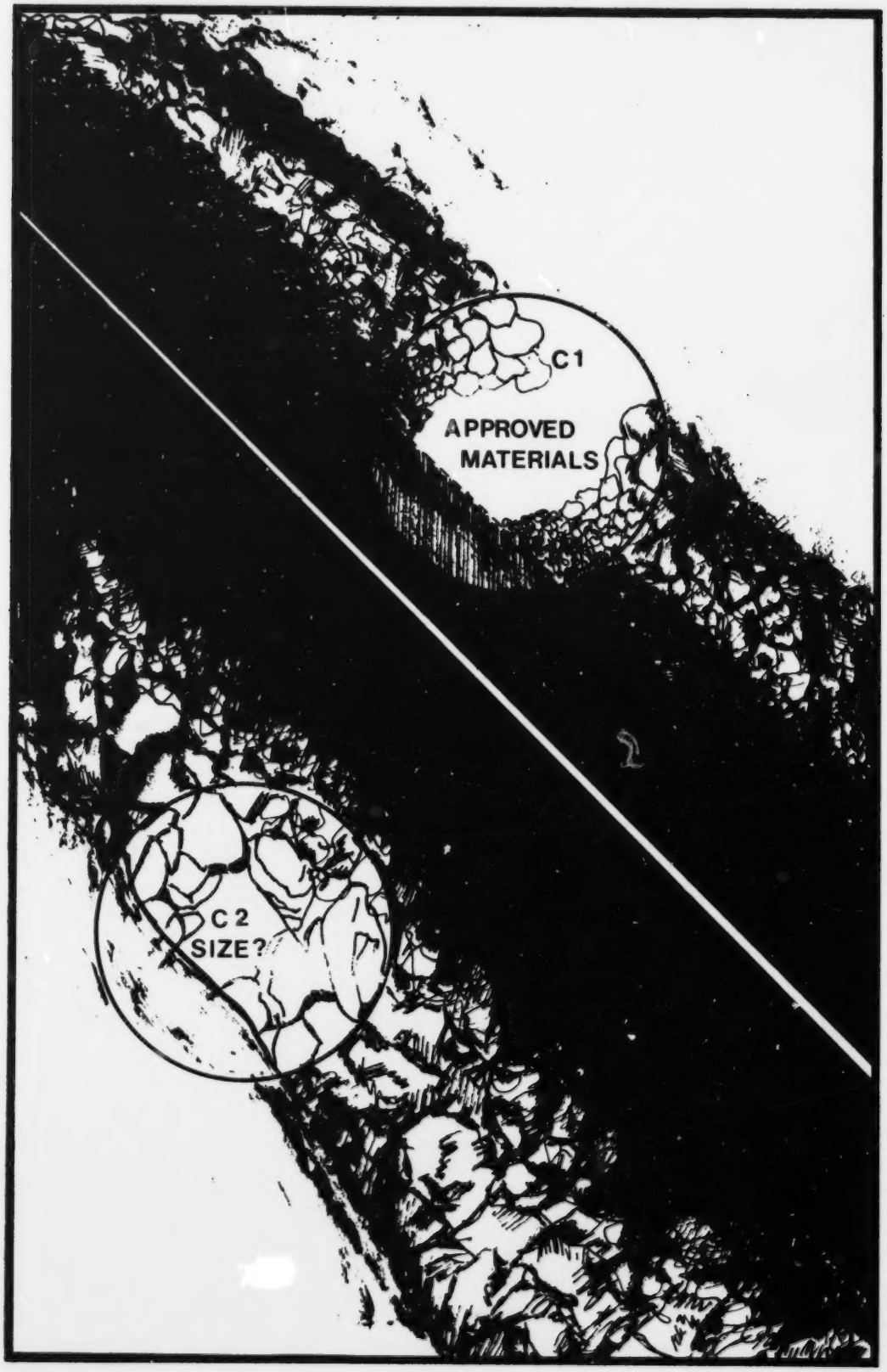


B12. Treated lumber and materials shall be completely dry before use in or near the water.

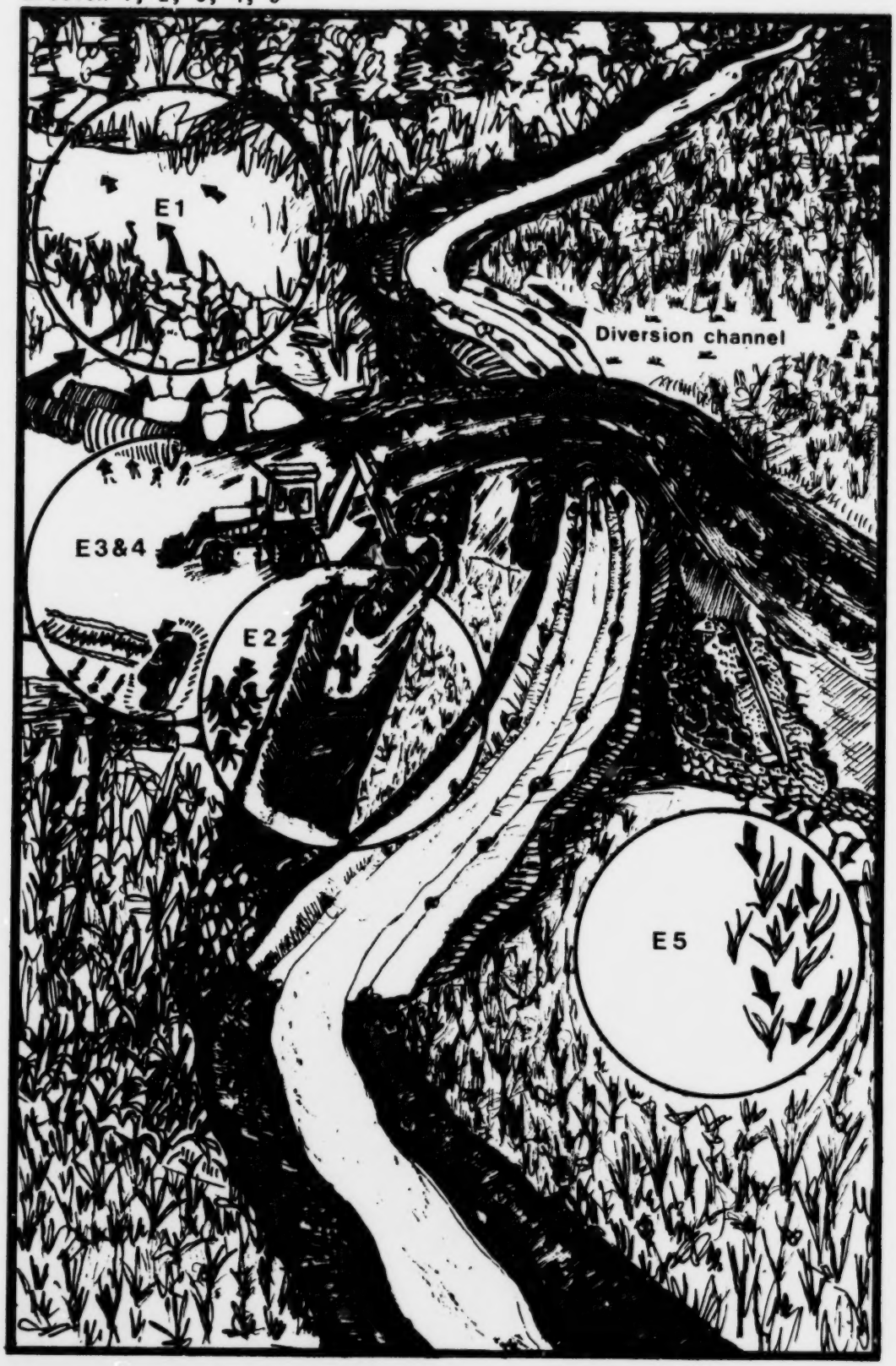
B13. All machine work shall be carried out from the watercourse banks unless permission has been granted by the Engineer to do otherwise.

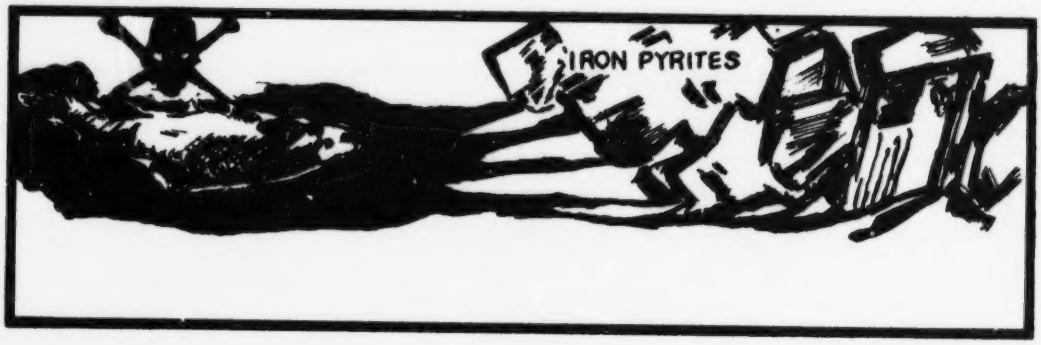
B14. Additional references: Section G, E10, E11, E13, E14, E16 and Section F.

Causeways 1, 2



Erosion 1, 2, 3, 4, 5



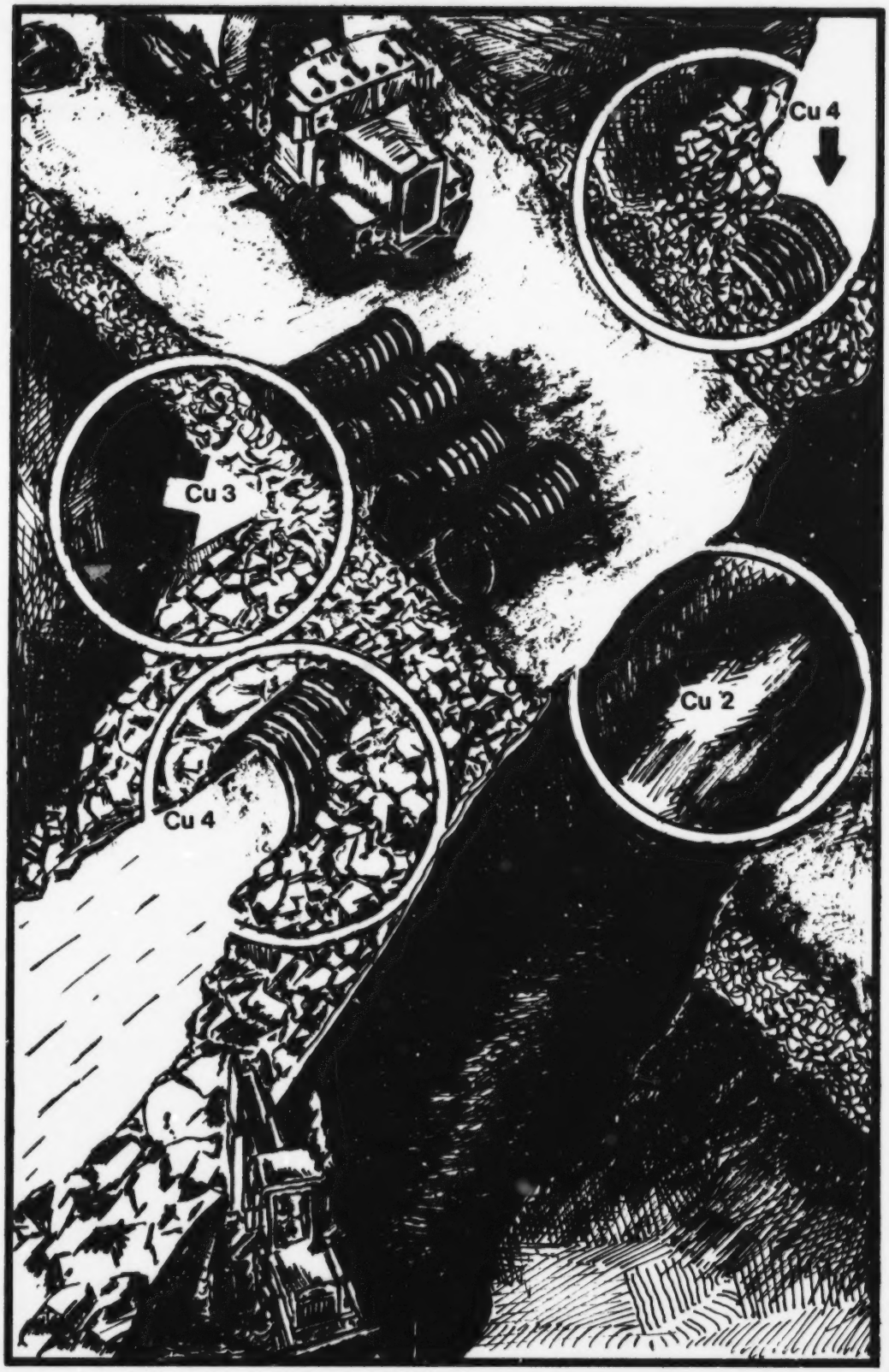


C4. All causeway construction material shall be non-toxic to aquatic life.

C5. Additional references: Section G, E10, E11 and E14.

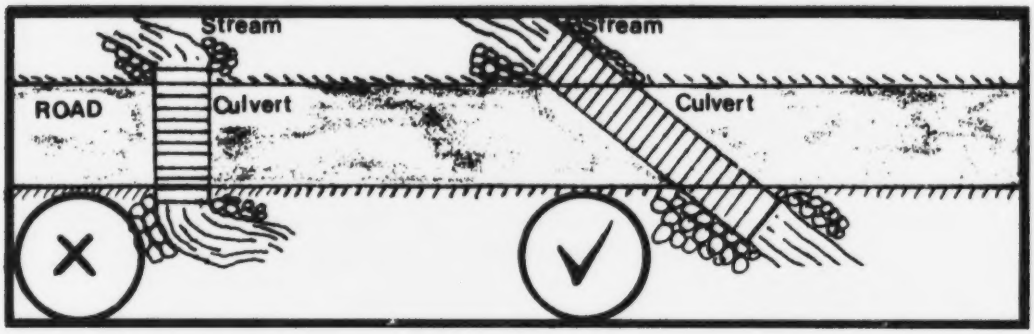
See pg. 25 for C1, C2, C3.

Culverts 2, 3, 4

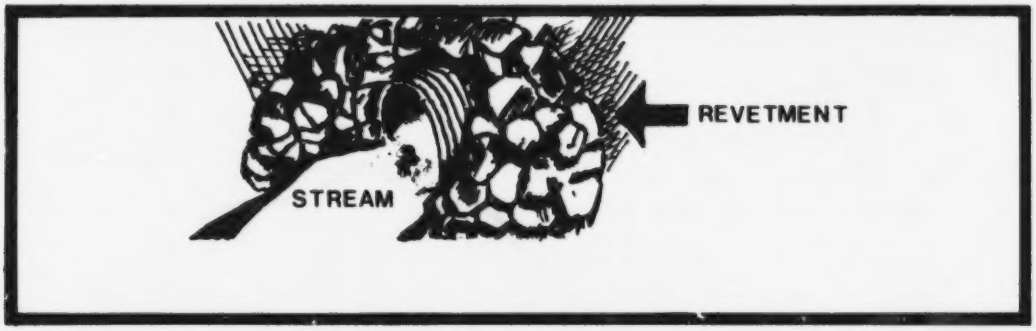


Culverts

CU1. All work shall be conducted in a manner to cause a minimum of siltation and disturbance to the adjacent and downstream area.



CU2. Install culverts parallel to, and as close as possible, to the original watercourse. Where culverts cannot be installed parallel, downstream banks shall be armoured with material approved by the Engineer.



CU3. The following uniformly graded stone riprap material shall be used for stream bank revetment unless alternate materials have been approved in writing by the Engineer.

Class 1

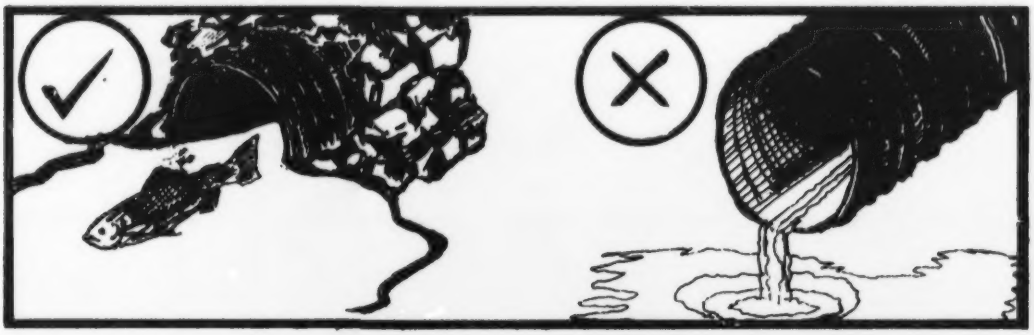
Local velocity up to 10 feet per second	Use 8-18 inch material

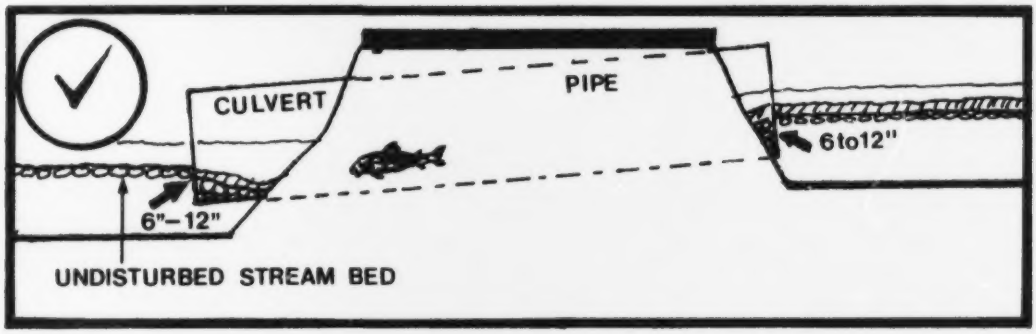
Class 2

Local velocity up to 13 feet per second	Use 12-30 inch material

Class 3

Local velocity up to 15 feet per second	Use 20-48 inch material

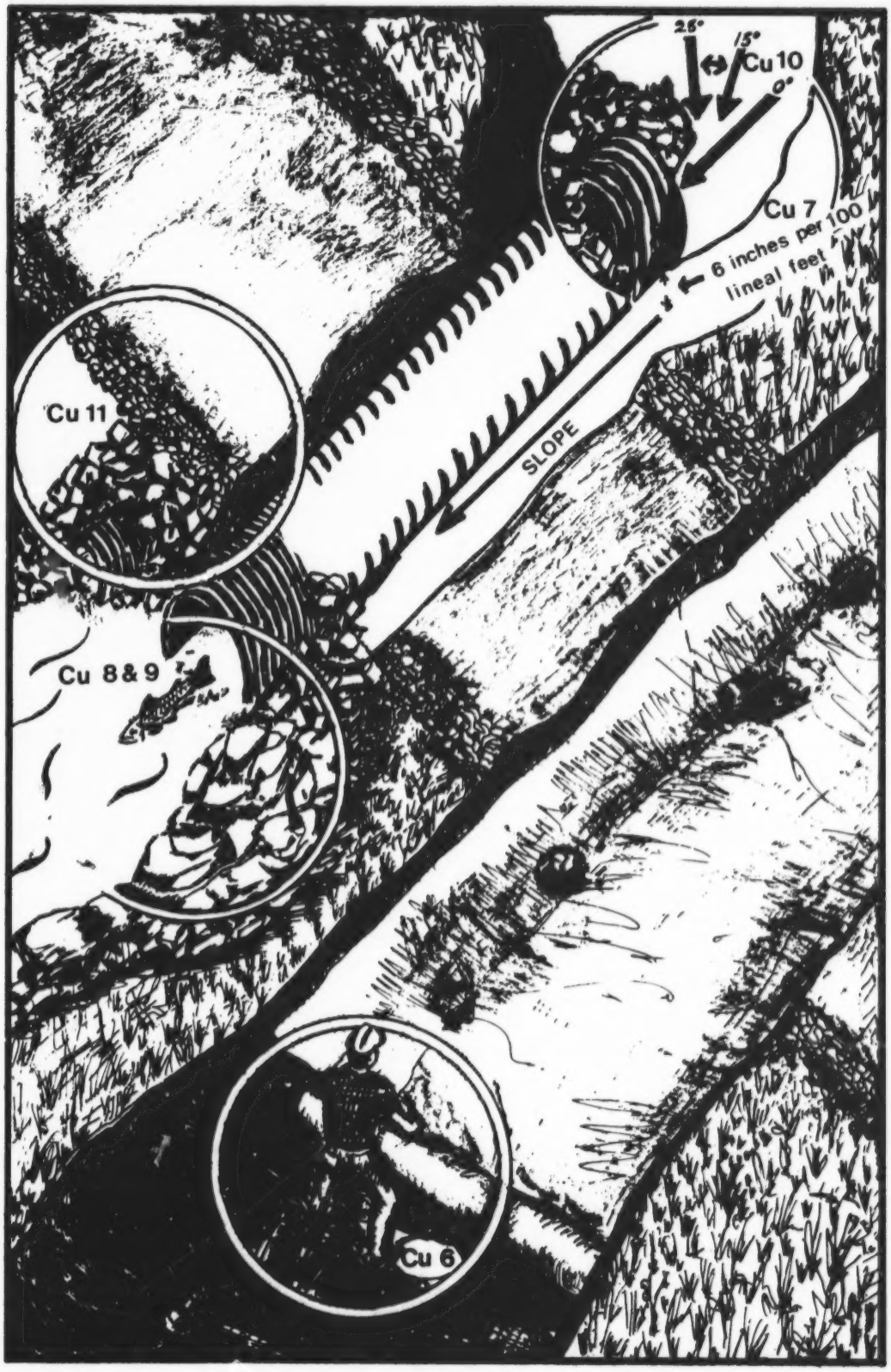


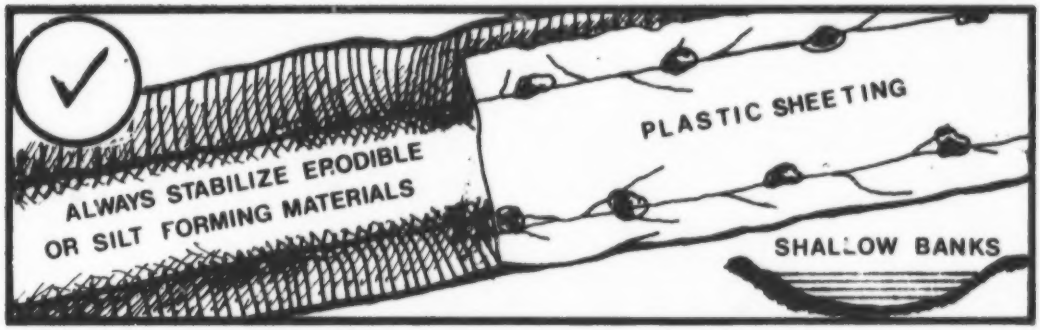


CU4. Culverts carrying stream flow shall be installed on a uniform slope, with the inlet and outlet positioned 6 to 12 inches below the natural stream bed. Note clause CU4 and CU7 are not applicable to local drainage culverts (e.g., driveway culverts, overland storm drainage).

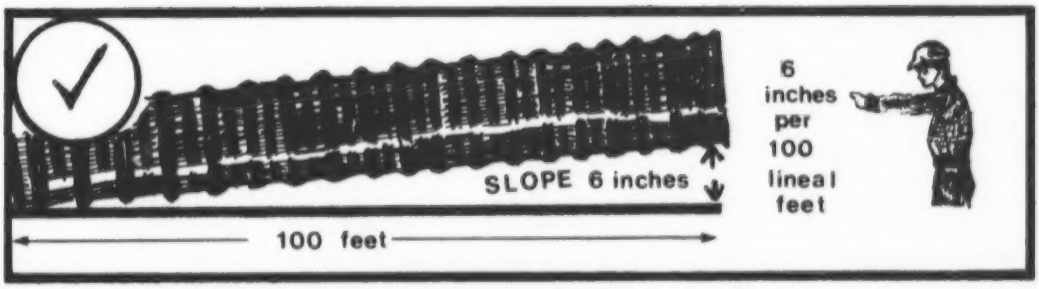
CU5. Excavation of diversionary channels shall be carried out in the dry from the downstream end.

Culverts 6, 7, 8, 9, 10, 11

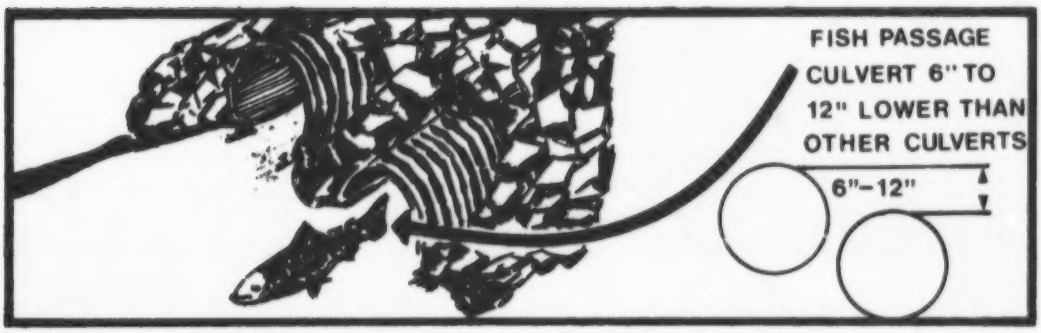




CU6. Diversionary channels constructed in erodible or silt forming materials shall be stabilized with protective rock, plastic sheeting or other approved materials before any flow is diverted.

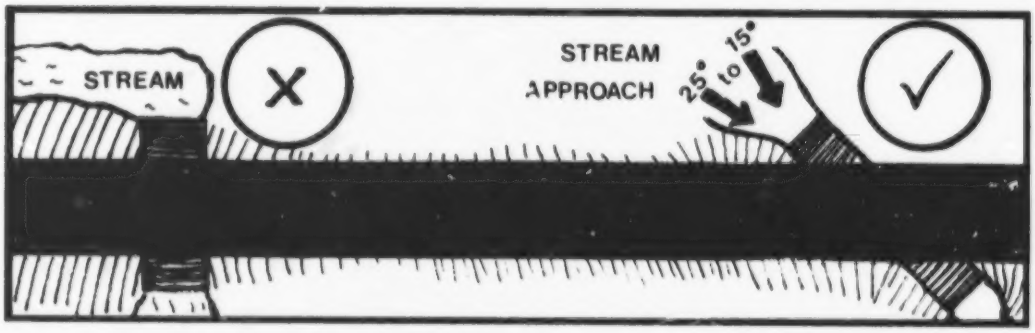


CU7. The maximum desirable culvert slope is 6 inches per 100 linear feet (0.5%). In cases where this requirement cannot be met, such as when the pipe is laid on the stream gradient; approved pipe arches, arches, interior baffling, or stilling basins shall be installed to maintain adequate depth in flow (minimum 6 inches) and velocity, to ensure proper conditions for fish passage. In no case shall a drop be permitted at the outlet of a culvert.



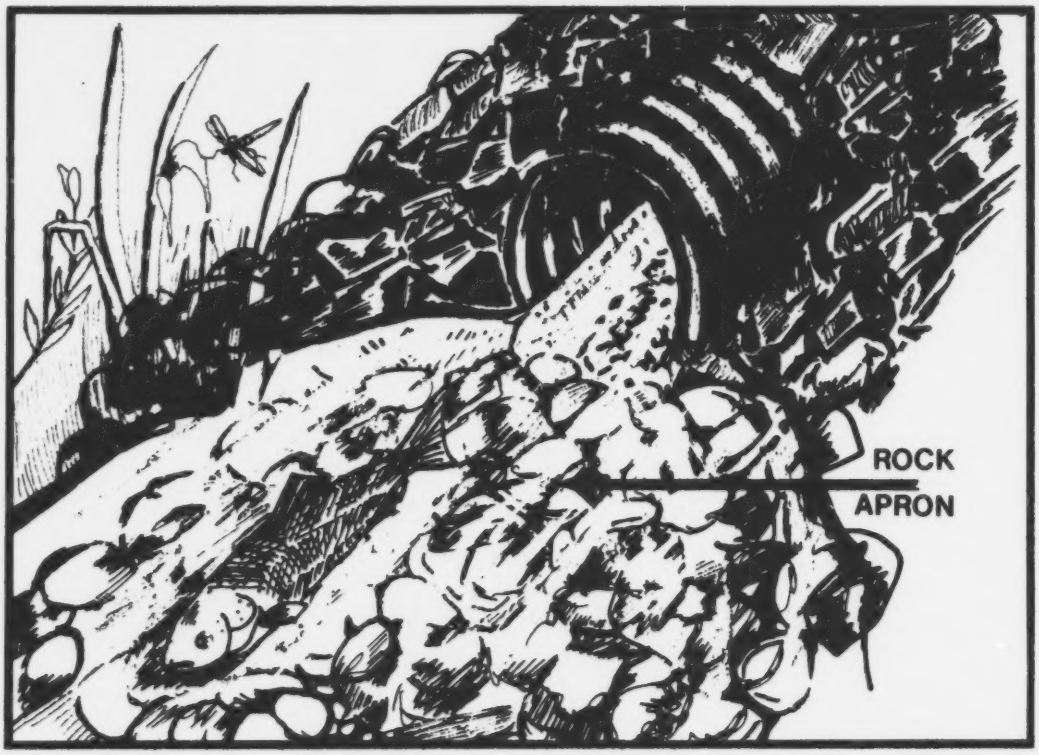
CU8. In the case of installations involving multiple culverts, it is recommended that the floor of the fish passage culvert be located 6 to 12 inches lower than the adjacent structures.

CU9. When more than one culvert is provided at crossing site, fish passage criteria need only be applied to one of the culverts.



CU10. The angle of culvert approach should be kept to a minimum and it is recommended that 15° be used and a maximum of 25° unless approved additional channel protection is constructed.

CU11. Inlets and outlets of all culverts shall be stabilized with riprap or other approved materials to the top of the pipe and a minimum of one pipe diameter on each side of the pipe, or pipes in the case of multiple pipe installations.

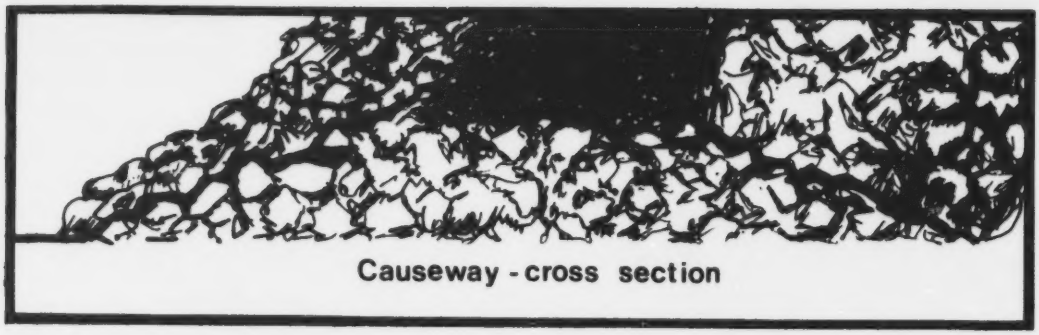


CU12. Unless otherwise instructed, rock aprons shall be constructed downstream of the outlets of all culverts to prevent scour of the streambed. Guidelines for the length of apron measured downstream from the end of the culvert and minimum riprap size should be as follows:

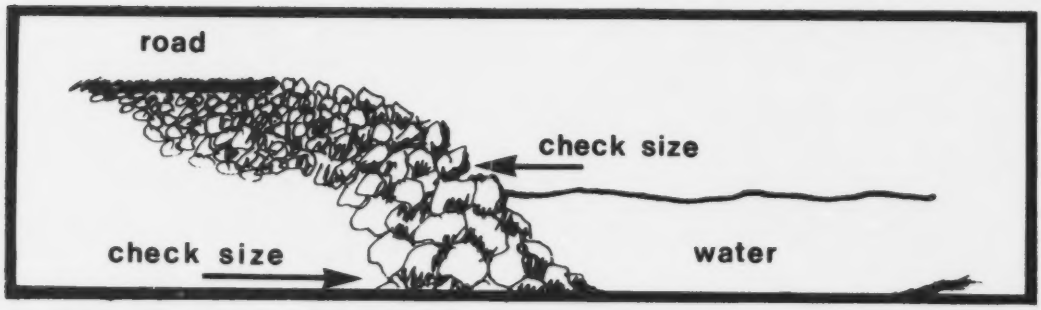
Culvert diameter	Length of apron	Average stone size	Apron thickness
Up to 4'	6 pipe dia.	6 inches	12 inches
4' to 7'	8 pipe dia.	12 inches	18 inches
7' to 10'	10 pipe dia.	24 inches	30 inches

CU13. Additional references: Section G, E2, E10, E11, E13, E14, E16 and Section F.

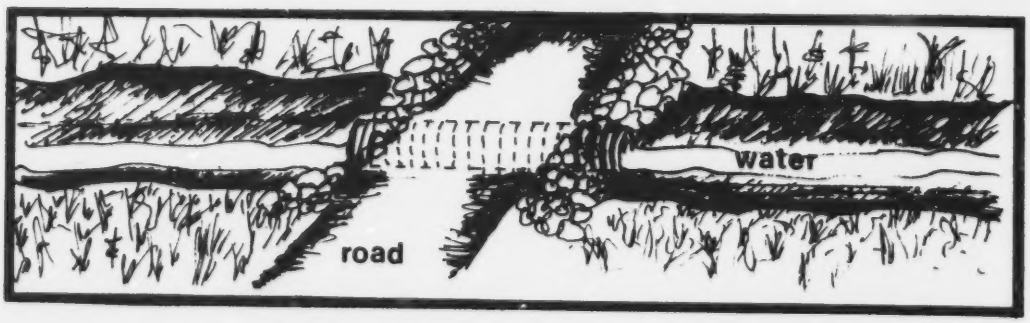
Causeways



C1. Causeways shall be constructed of approved materials which will provide a minimum of siltation.



C2. The toe and the embankment of all causeways shall be protected with material satisfactory to the Engineer to prevent scour or erosion due to waves, ice, and currents.



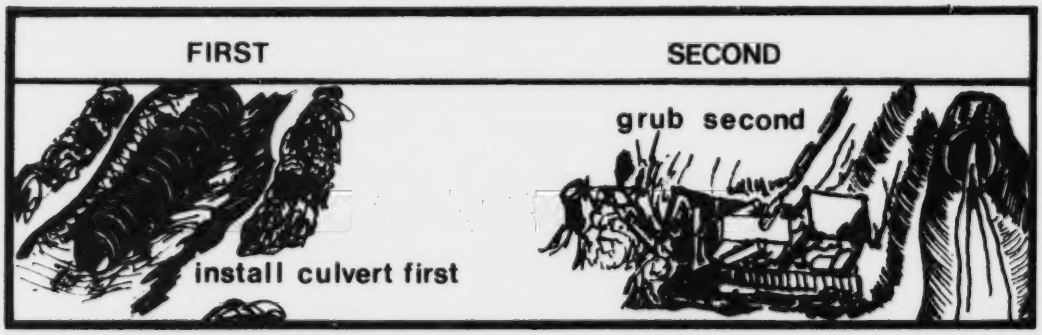
C3. For temporary causeways, drainage shall be provided to accommodate seasonal runoff conditions.

See pg. 17 for C4, C5.

Erosion Control

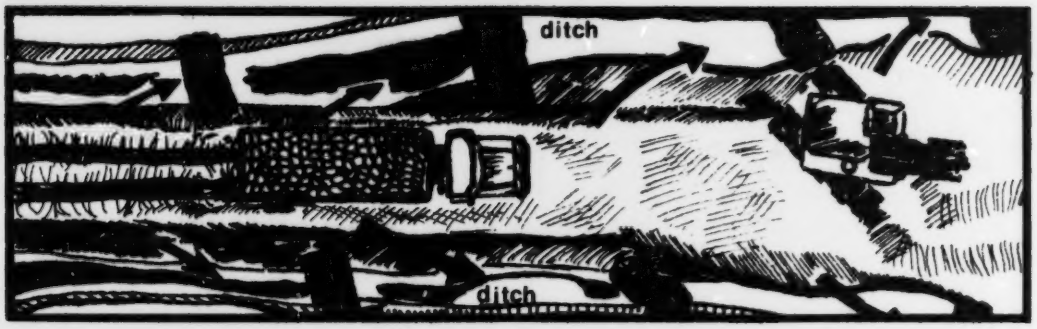
Unless otherwise noted in writing by the Engineer, all construction site runoff shall be adequately treated to prevent siltation of watercourses.

E1. Temporarily divert upstream sheet runoff or overland flow drainage away from the construction site. Care shall be taken not to create other drainage problems by this diversion.



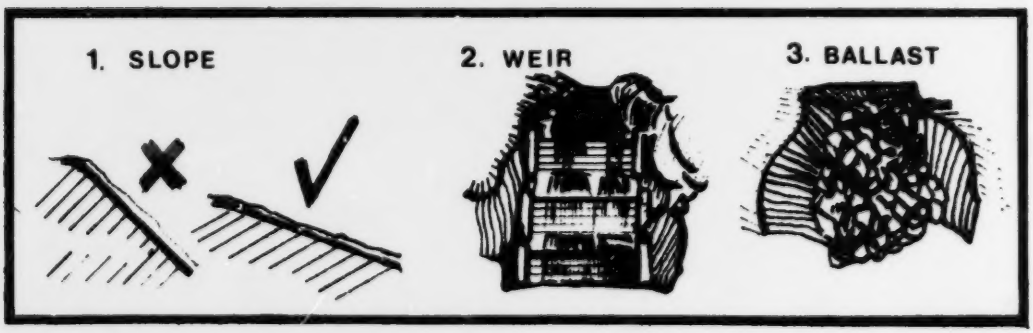
E2. Where possible, install culverts prior to grubbing.

E3. Sediment traps or filters shall be constructed in roadside ditches or at culvert inlets prior to grubbing.



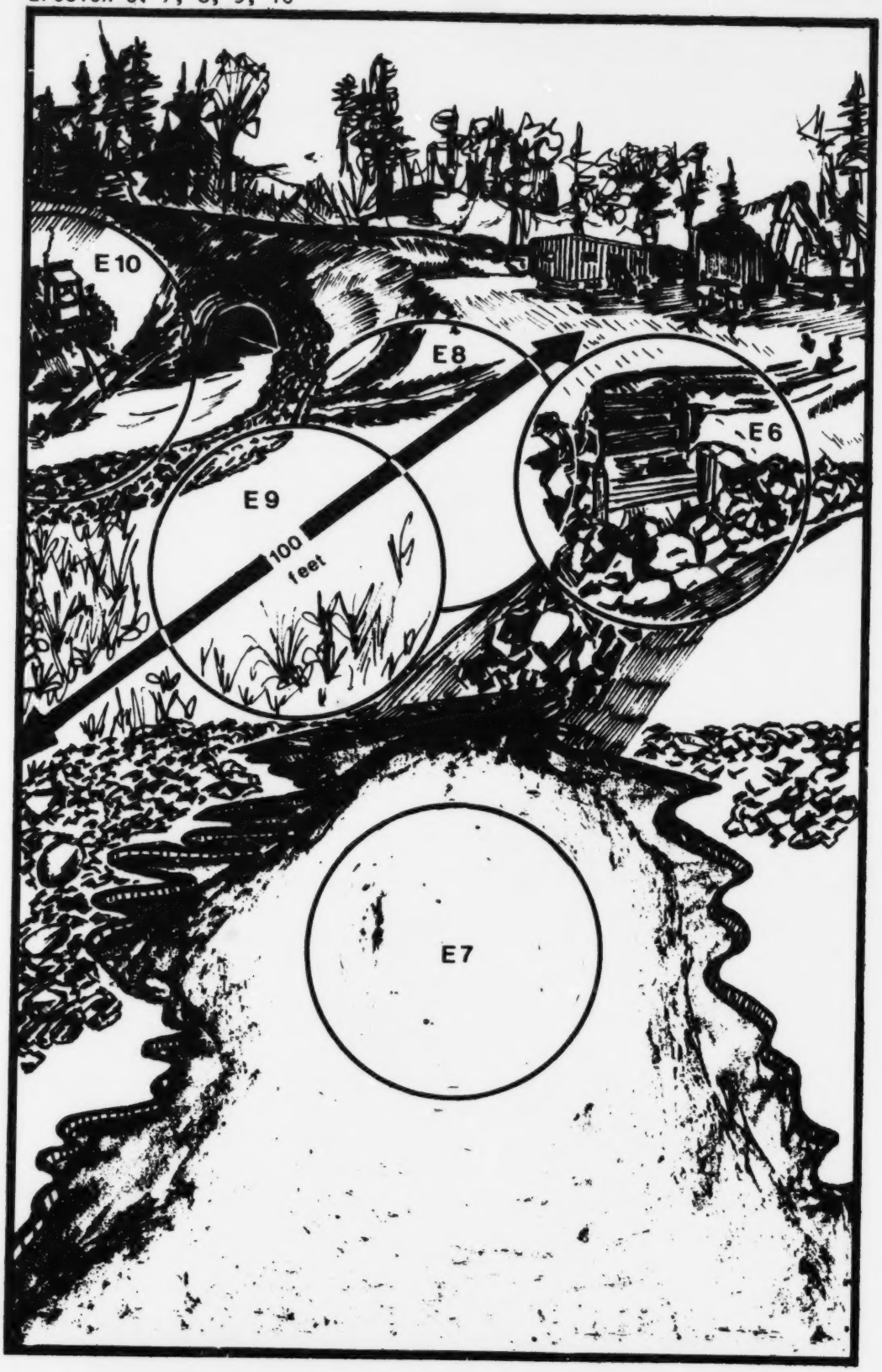
E4. Minimize the volume of construction runoff to be treated by each filter, by dispersion into as many drainage ditches as possible.

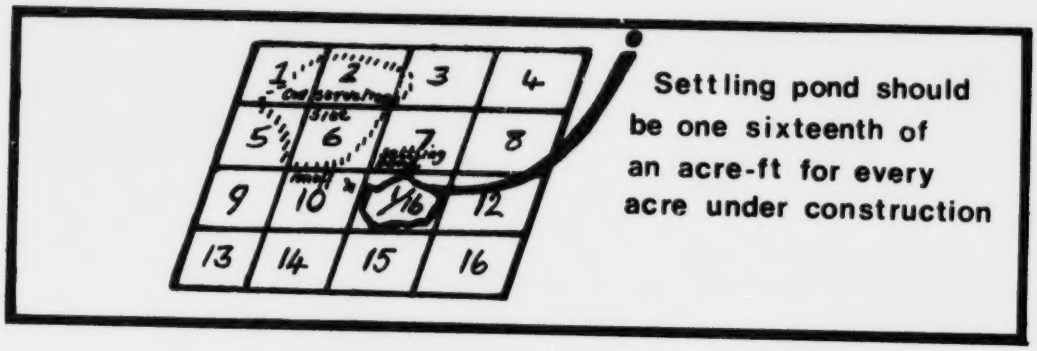
E5. Where possible, disperse construction runoff in small volumes through the natural vegetation before it reaches the watercourse.



E6. Reduce the velocity of runoff over the construction site by reducing the slope of construction ditches or by the placement of weirs or ballast rock in the ditches.

Erosion 6, 7, 8, 9, 10





E7. Provide settling ponds of suitable size to retain runoff long enough to allow for precipitation of solids. A general guideline is 1/16 acre-ft of storage to be provided for every acre of exposed construction area.

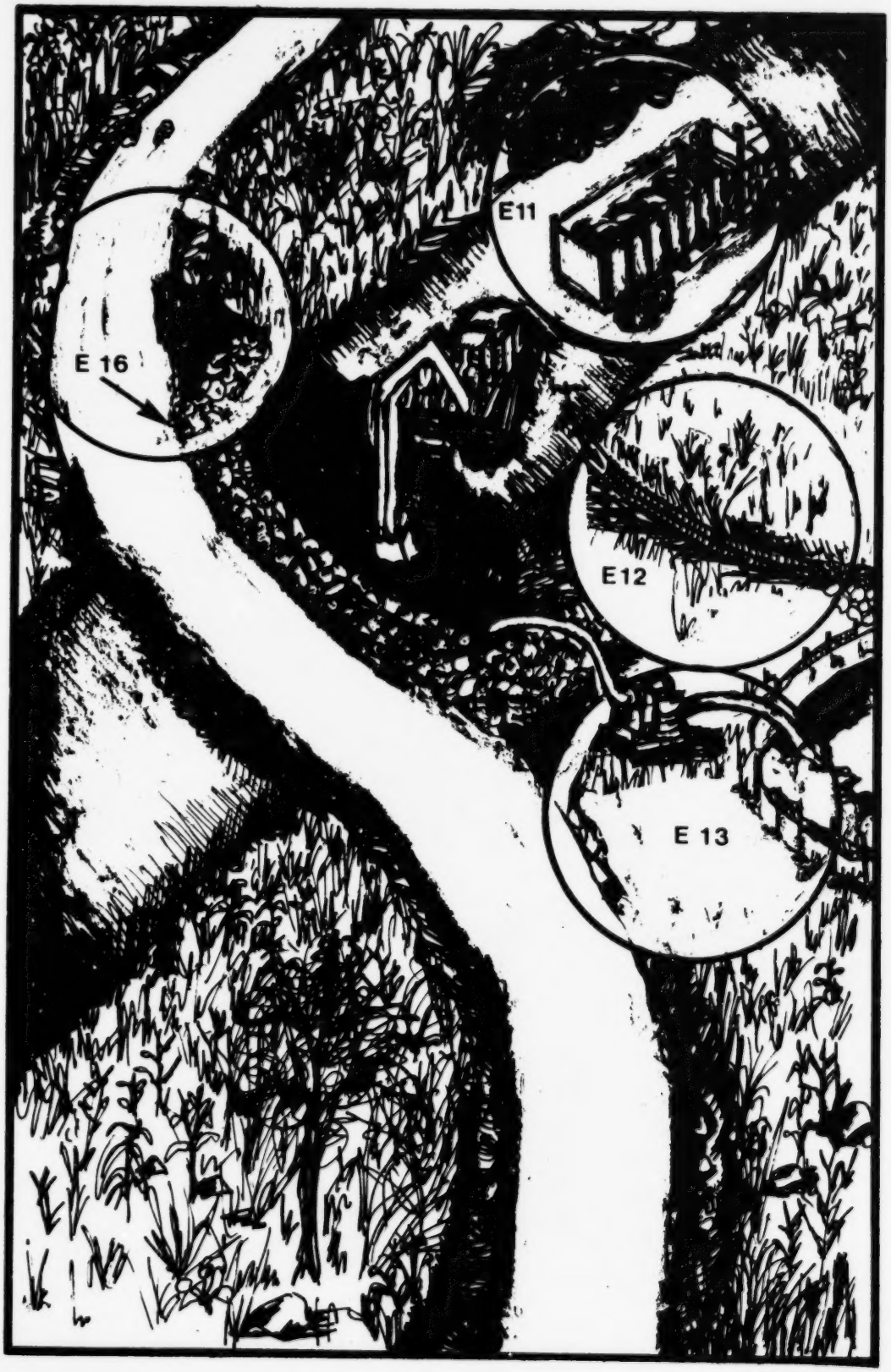
E8. Establish roadside ditches to inlets and outlets of culverts as early as possible and where necessary in the opinion of the Engineer, line roadside ditches with erosion protection material.

E9. A buffer strip of undisturbed vegetation at least 100 feet wide shall be maintained between construction activity and any stream crossing. For information on actual water crossings, refer to the applicable sections.

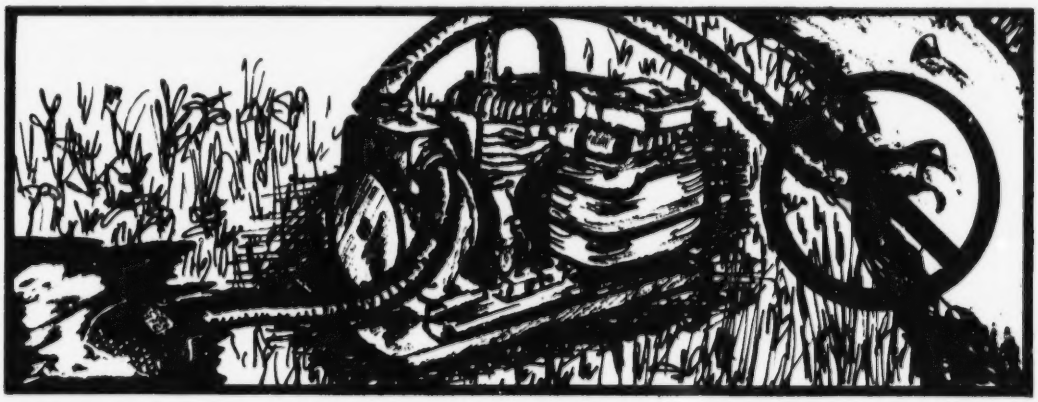
E10. Trees shall be felled away from watercourses, but should any trees fall into a watercourse, they shall be removed immediately.

E11. Excavated material shall be located in an area to minimize silt transport due to storm water runoff.

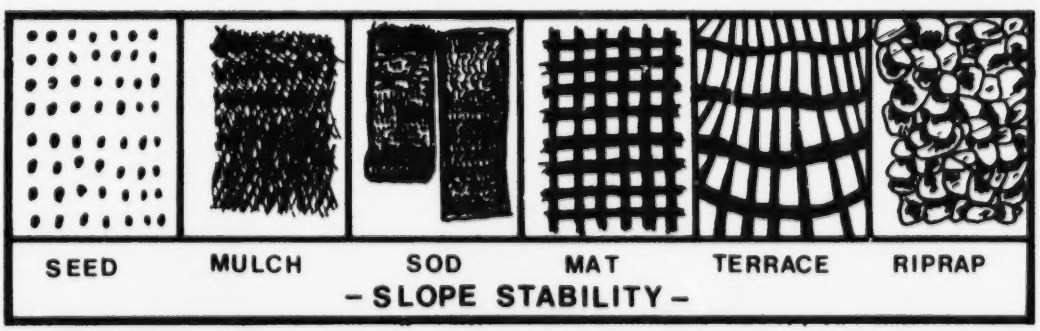
Erosion 11, 12, 13, 16



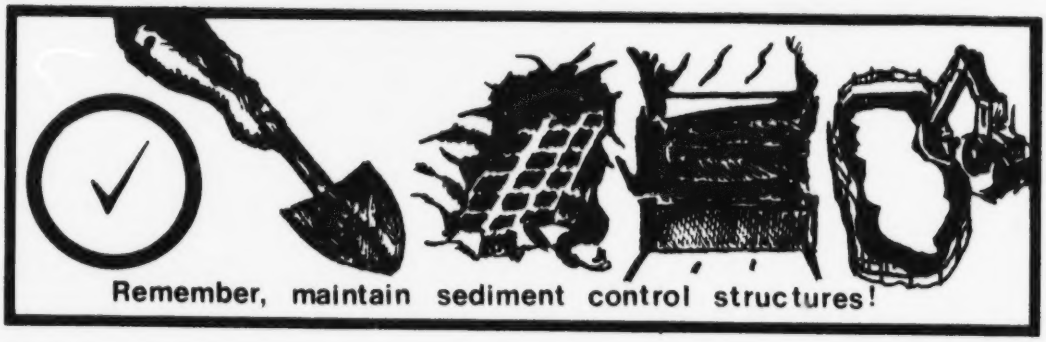
E12. When disposing of road drainage over a steep cut or fill, construct an apron, diversion dyke, or discharge pipe all the way to the bottom of the embankment when undue erosion is expected to affect a watercourse.



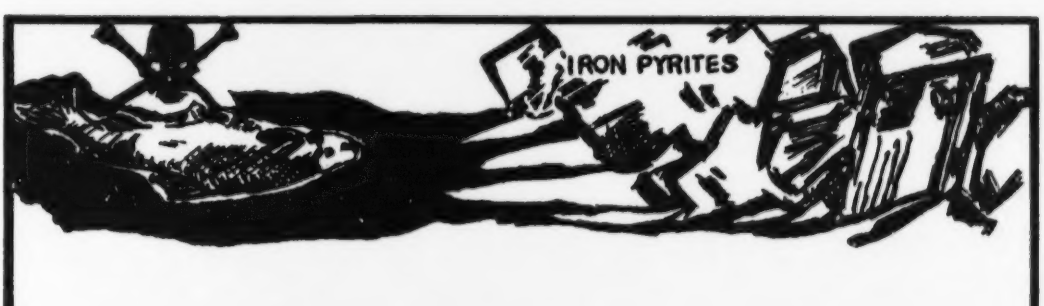
E13. All excavation dewatering should be treated for silt removal. <u>Do not</u> pump water directly into a watercourse.



E14. Where possible, stabilize all erosion sites by reducing slopes, hydro seed, mulch, sod, mat, terrace or riprap as work progresses (not at the end of the project).



E15. Maintain filters and sediment traps or ponds free of excessive silt buildup during the project.



E16. Erosion control works shall be constructed of clean, non-ore bearing, and non-toxic materials.

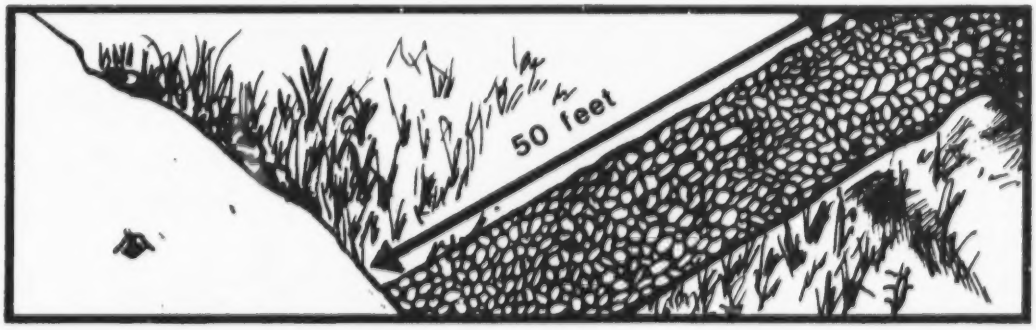
Fording 2, 3

Fording

January	April	July	October
no	no	✓	no
February	May	August	November
no	no	✓	no
March	June	September	December
no	✓	✓	no

F1. Unless otherwise instructed by the Engineer, temporary ford construction and use shall be limited to the inclusive period of June to the end of September.

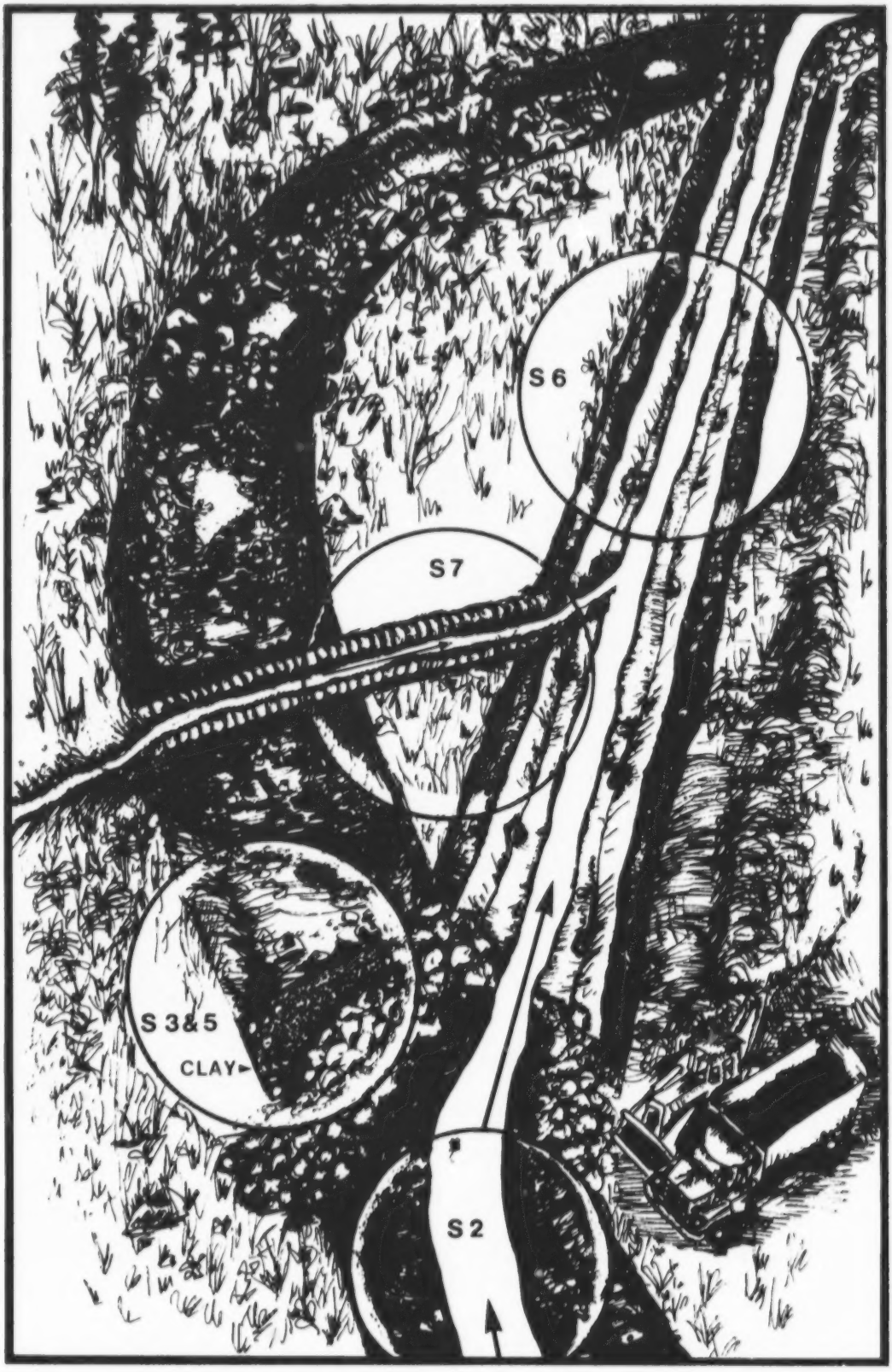
F2. Watercourse crossing approaches should be as near a right angle to watercourse as possible to minimize bank disturbance.



F3. To prevent silt tracking, both sides of the ford shall have non-erodible material placed from the water's edge to a distance of 50 feet up the bank.

F4. Additional references: Section G, E10, E11, E14 and E16.

Stream Diversion 2, 3, 4, 5, 6, 7



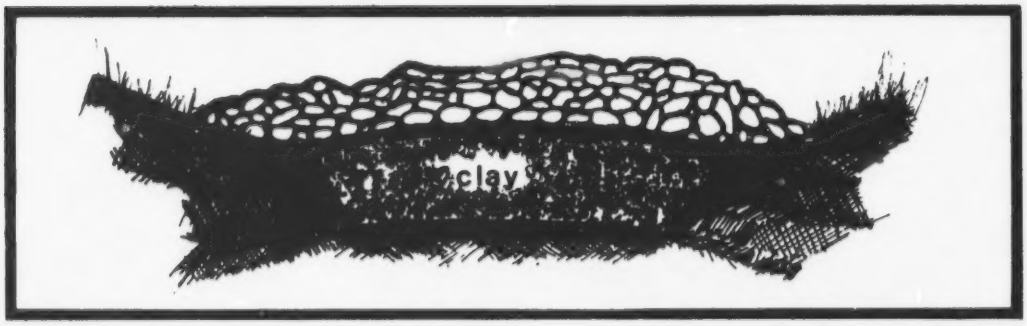
Stream Diversion (temporary)

S1. Work operations shall be carried out at all times so as to cause a minimum of disturbance and siltation to streams.

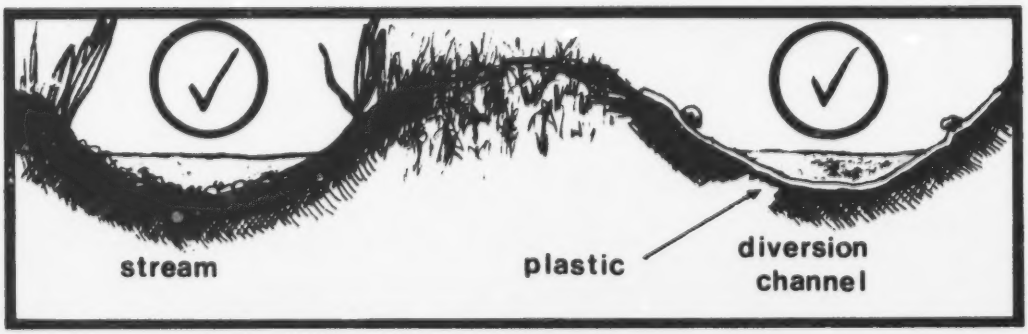
S2. Construction shall be done during low flow water months, typically, June through September. Upon request, the Engineer may with the appropriate government approval, grant construction approval during other time periods.

S3. The existing channel shall be left untouched until the cutoff channel has been completed and approved by the Engineer.

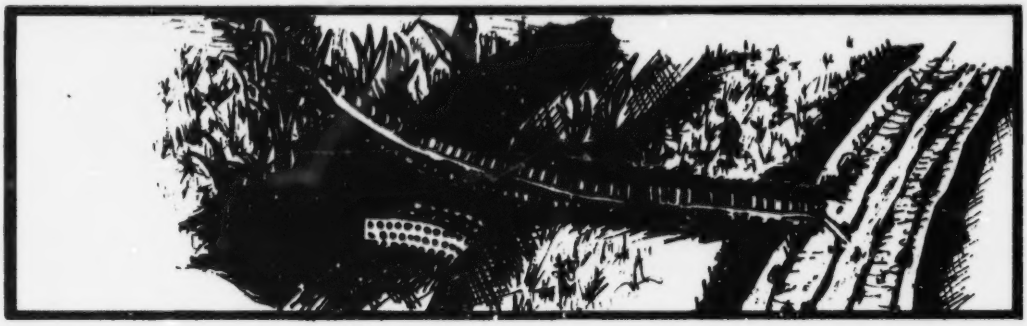
S4. Excavation shall be carried out in the dry from the downstream end. Trial and error cut methods are not acceptable.



S5. The end of the existing channel shall be closed off with non-porous and non-erodible materials.



S6. As much as possible, the diversion channel should physically resemble a diverted channel in cross-section.



S7. If a tributary stream enters the old channel along the reach bypassed by the cutoff, provision shall be made to connect the tributary to an appropriately designed channel, to the main channel.

S8. Additional references: Section G, E10, E11, E13, E14, E16 and Section F.

Jointly illustrated by Tony Honeyborne and Gail Jeffery with funds provided by Fisheries Resource Employment Development Program for Youth.